



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification⁶ :
F23G 7/06

A1

(11) International Publication Number: WO 97/21959
(43) International Publication Date: 19 June 1997 (19.06)

(21) International Application Number: PCT/SE95/01476

(22) International Filing Date: 8 December 1995 (08.12.95)

(71) Applicant (for all designated States except US): GRACE TEC SYSTEMS AB [SE/SE]; Theres Svenssons Gata 10, S-417 55 Göteborg (SE).

(72) Inventors; and

(75) Inventors/Applicants (for US only): HEED, Björn [SE/SE]; Utlandagatan 19, S-412 61 Göteborg (SE). KÄLLSTRAND, Åke [SE/SE]; Hagelyckegatan 20, S-416 56 Göteborg (SE).

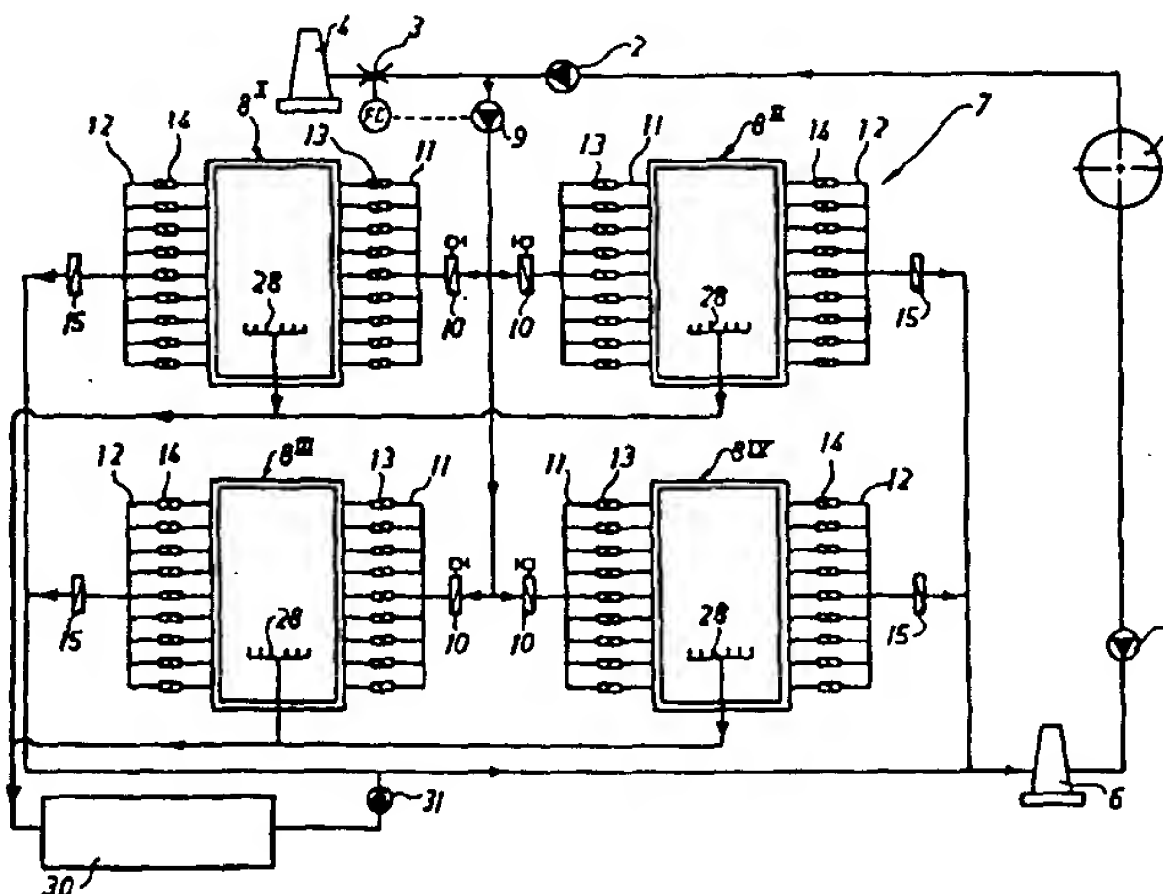
(74) Agent: AWAPATENT AB; P.O. Box 11394, S-404 28 Göteborg (SE).

(81) Designated States: AM, AT, AT (Utility model), AU, BG, BR, BY, CA, CH, CN, CZ, CZ (Utility model), DE (Utility model), DK, DK (Utility model), EE, EE (Utility model), ES, FI, FI (Utility model), GB, GE, HU, IS, JP, KG, KP, KR, KZ, LK, LR, LT, LU, LV, MD, MG, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SI, SK, SK (Utility model), TJ, TM, TT, UA, UG, US, VN, ARIPO patent (KE, LS, MW, SD, SZ, UG), European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, GA, GN, ML, MR, NE, SN, TD, TG).

Published

With international search report.

(54) Title: A METHOD AND A DEVICE FOR RECOVERY OF ENERGY FROM MEDIA CONTAINING COMBUSTIBLE SUBSTANCES EVEN AT LOW CONCENTRATION



(57) Abstract

The invention relates to a method and device for recovery of energy from a medium containing combustible substances even at low concentrations. The method is characterized by raising the temperature of the medium in a regenerative combustor (8), i.e. a reversal direction combustion device wherein the combustion takes place in a warm zone, to the combustion temperature at which essential chemical energy of the combustible substances is transformed into thermal energy. The heated medium is then utilized for the production of a wanted form of energy.

CLAIMS

1. A method of recovering energy from a medium containing combustible substances even at low concentrations, c h a r a c -
t e r i s e d by raising the temperature of the medium in a regen-
erative combustor (8), i.e. a reversal flow direction combustion device
5 wherein the combustion takes place in a warm zone, preferably a
combustion exchanger (8), to the combustion temperature at which
essentially all chemical energy of the combustible substances is
transformed into thermal energy, and by utilizing the heated medium
for the production of a wanted form of energy.
- 10 2. A method as claimed in claim 1, c h a r a c t e r i s e d
by diverting, after the combustion of the combustible substances, at
least a portion of the energy from the regenerative combustor (8) for
use in the production of energy.
3. A method as claimed in claim 2, c h a r a c t e r i s e d
15 by diverting at least a part flow of the medium from the regenerative
combustor (8).
4. A method as claimed in claim 3, c h a r a c t e r i s e d
by utilizing the diverted medium in a steam boiler (30), followed by a
turbine and a generator, for the production of electric energy.
- 20 5. A method as claimed in any one of claims 1-4, c h a r -
a c t e r i s e d in that the medium is a gas.
6. A device for use in performing the method according to any
one of claims 3-5, c h a r a c t e r i s e d in that the regenera-
tive combustor (8) comprises a diverting means (28) for diverting the
25 heated medium.
7. A device as claimed in claim 6, c h a r a c t e r i s e d
in that the diverting means (28) is arranged to divert medium from the
area of the combustion zone of the regenerative combustor (8), pref-
erably the bed (23) of a combustion exchanger (8).
- 30 8. A device according to claim 7, c h a r a c t e r i s e d in
that the diverting means (28) comprises at least one perforated tube
which is positioned in the combustion zone and which is connected to
an energy-production installation.

9. A device as claimed in claim 8, c h a r a c t e r i s e d in that the energy-production installation is a steam boiler (30), followed by a turbine and a generator.

10. The use of the method and/or the device in accordance with
5 anyone of the above claims for mining operations, wherein the medium is a mine gas.

11. The application of the method and/or the device in accordance with anyone of claims 1-9 in a digestion plant, wherein the medium is a digestion gas.

10 12. The application of the method and/or the device according to anyone of claims 1-9 in a production plant, wherein the medium is an exhaust gas.

13. The application of the method and/or the device according to anyone of claims 1-9 in an animal production plant, e.g. a breeding
15 installation, wherein the medium is an exhaust gas.

14. The application of the method and/or the device according to any one of the claims 1-9 in any kind of gas escapes, seepings or bleedings, e.g. natural gas bleedings from the soil, wherein the medium is a mixture of a combustible substance in air.

20 15. The application of the method and/or the device according to any one of the claims 1-9 in any kind of escapes or bleedings from an industrial process, e.g. evaporative losses from processing or storage or distribution of combustible substances wherein the medium is a mixture of the substance in air.